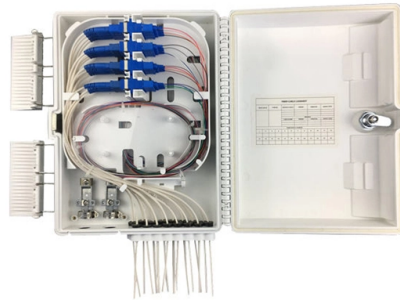


Fiber optic patch cords UPC and APC



Overview

LC/UPC They are designed, manufactured and tested according to protocol and Fiber Patch Cord & Pigtail: Complete Selection Guide 2026 | OPELINKComprehensiv.

Key Takeaways

APC (Angled Physical Contact) and UPC (Ultra Physical Contact) patch cords differ mainly in ferrule end-face geometry, affecting return loss and reflection performance.Overview

Fiber optic patch cords are short, flexible cables with connectors on both ends, used to interconnect devices like switches, servers, and patch panels in optical networks . The connector type and polish significantly influence signal quality. UPC and APC are two common polish types:

- UPC (Ultra Physical Contact): The ferrule end-face is slightly curved (domed) and polished flat, providing a large contact area for minimal insertion loss. Return loss is typically ≥ 50 dB, meaning some light is reflected back into the fiber . UPC connectors are usually blue and are suitable for high-speed digital networks where reflections are less critical.



- **APC (Angled Physical Contact):** The ferrule end-face is polished at an 8-degree angle, which redirects reflected light into the cladding rather than back to the source. This results in higher return loss (≥ 60 dB), reducing back-reflection and improving signal stability. APC connectors are usually green and are preferred for analog systems, high-speed or long-distance applications, and scenarios sensitive to reflections.

Key Differences

Feature	UPC	APC
Ferrule End-Face	Flat with slight curvature	8° angled
Return Loss	≥ 50 dB	≥ 60 dB
Insertion Loss	≤ 0.2 dB	≤ 0.3 dB
Reflection	Moderate	Excellent

Typical Applications

Digital networks, Ethernet, data centers	Analog signals, high-speed telecom, FTTH, RF video
Selection	Considerations

- **Digital vs Analog:** UPC is sufficient for most digital networks, while APC is critical for analog or high-speed optical systems where reflections can degrade performance.

- **Connector Color:** Blue for UPC, green for APC, aiding visual identification.

- **Insertion vs Return Loss:** UPC offers slightly lower insertion loss, but APC provides superior return loss, which is crucial for sensitive applications.

- **Network Environment:** APC is preferred in long-haul, high-bandwidth, or RF-over-fiber deployments; UPC is common in enterprise LANs and data centers. Choosing the correct patch cord type ensures optimal network performance, minimizes signal reflection, and maintains reliable optical transmission.

Article Content

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SOPTO

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